New York State Department of Transportation
Office of Engineering

OPERATIONAL PLAN
SFY 1999-2000 and Beyond

Technical Services

Quality People

Quality Service

Geotechnical
Highway Data
Materials
Transportation Research

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TECHNICAL SERVICES DIVISION
OPERATIONAL PLAN FOR SFY 1999/00 AND BEYOND

PLAN OF ACTION

Introduction

The Operational Plan for Technical Services contains and describes the priorities, issues and goals for the program area for SFY 1999/00 and beyond.

The Technical Services program provides materials and geotechncial engineering services, data services and targeted transportation research to the Department through the:

- conduct of specialized studies requiring investigations, testing and analysis, utilizing both internal and external resources.
- collection and dissemination of data on the inventory, condition, and use of the State Highway System.
- management and operation of a materials quality assurance program.
- development, recommendation and implementation of engineering policies, standards and specifications.

These services are provided through the Materials, Geotechnical Engineering, Highway Data Services, and Transportation Research and Development Bureaus in the Central Office in conjunction with the Technical Services, Materials and Geotechnical units in the Regions. The Technical Services program is founded on a multi-million dollar investment in laboratories and equipment in both the Central Office and the Regions and a dedicated, capable staff. This year we welcome the Highway Data Services Bureau to the Division. This new Bureau provides a range of services important to the Department. These include traffic monitoring, highway inventory, condition attributes and the photolog system. There are approximately 280 employees in the Division and more than 300 in the Regional counterparts. In the Regions, the program receives its staff through the Design, Construction and Planning program budgets.

The program serves all elements of the Department as well as some external clients because of the program units' expertise and facilities. The services provided directly support the planning function, capital program and this, along with research and development, are the most significant parts of the mission.

The strength of our Division clearly lies within its people. We are a Division of experts in geology, chemistry, pavement design, pavement materials, data services, structural engineering, geosynthetics, materials sciences, foundation engineering, physical testing, decision sciences, quality assurance and many other disciplines.

NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

To any observer of trends in the field of transportation, it is obvious the future will require much more sophistication than the past. The materials, designs, specifications, processes, techniques, and contractual arrangements will all require more sophistication on the part of the Department, its consultants, its contractors and their suppliers.

The Department's theme is "Smarter and Faster" and its priorities have been articulated:

- MANAGE THE TRANSPORTATION SYSTEM
  Maintain and operate the State's highways and bridges in a safe, cost effective and environmentally sound manner.

- PROMOTE ECONOMIC GROWTH
  Promote economic growth in New York State by planning, coordinating, and/or implementing strategies to improve the State's transportation network.

- PROVIDE TAXPAYER VALUE
  Continuously improve essential services, projects, information and processes.

It is clear that the mission of this Division directly supports the priority activities of the Department.

However, given the resources we have, we will be challenged to effectively deliver the full range of services as contained in our mission statement.

Once again, last year we were only able to accomplish a few critical promotions and very limited hiring. The future is unsettled on many fronts. This year we will need to determine the size and delivery mechanism for transportation research. We will need to fully assimilate the new Highway Data Services Bureau into the Division, including its relocation to either Building 7 or 7A. We will need to reduce or eliminate, if possible, the number of people serving in acting positions. We will need to hire a limited number to replace those who retire or relocate elsewhere.

This Division and the Department face significant challenges in 1999/00 and beyond. Working together, the people within Technical Services are equal to the challenge.

While we look to new ways to fulfill our mission within a framework of constrained resources, we expect support in the resolution of issues that are beyond our control or authority.

QUALITY SERVICES

The Division takes justifiable pride in its accomplishments; both in terms of its production and continuous improvement achievements.

A sampling of the production activities follows:

NUMBER	ACTIVITY
1,816	NYSDOT employees trained by the Materials Bureau
1024	NYSDOT employees trained by the Geotechnical Engineering Bureau
47	NYSDOT and Local Government employees trained in Pavement Condition scoring by Highway Data Services Bureau
25,749	Kilometers of State highway inventoried and condition scored
2,970	Transactions by Research Library
8	Research Newsletters
6229	Soil Sample Identification Tests
250	Bridge Foundation Designs
14,513	Kilometers of highway filmed via Photolog, 4751 Photolog prints sold
329	Evaluations of Materials Plants & Facilities
26	Soil Consolidation Tests
114	Wall Designs
73	Geologic Survey & Analysis of Rock Cut Slopes
7948	"Short" traffic counts taken on 6647 locations around the state
426	Vehicle classification counts taken
300	Public Inquiries for highway data answered
1605	Municipalities contacted to update the Local Highway inventory
109	Materials Project Level Design Consultations
518	General Roadway Inspections
77	Revisions to Geotechnical Specifications & Standards
18	Materials QA Procedures developed/ revised
88,759	Materials Tests completed on 23,594 samples
11	Research and Technical Services Publications produced
6	Contract Research Assignments Executed
3486	Geosynthetic Tests completed
8532	Granular Materials Soils Tests
23	Roadway Foundation Designs
140	Materials Construction Evaluations
50	Soil Strength Tests
1301	Topsoil Tests
15	Papers published by Transportation Research Board or other National technical forums
4	Department sponsored NCHRP Research Projects approved for funding

A sampling of our continuous improvement activities follows:

PAVEMENT FRICTION

Materials Bureau staff evaluated the performance of friction aggregates in hot mix asphalt pavements at congested roadways and areas of high traffic volume intersections throughout the state. The study led to changes in the friction aggregate requirements that will limit the amount of Wappinger Dolomite coarse aggregate used in hot mix asphalt surface courses. Bureau staff prepared the first Department Engineering Directive, ED 99-001, Revised Friction Aggregate Requirements in Hot Mix Asphalt Specifications, for new contracts; and assisted the Construction Division in the preparation of an Engineering Bulletin, EB 99-020, to change on-going projects by order-on-contract. In addition, the staff developed specifications and procurement documents for and received delivery of a new pavement friction testing system.

HOT MIX ASPHALT QUALITY ADJUSTMENT UNITS

The Department began making payment adjustments for the quality of HMA in 1990 for in-place density and in 1996 for plant production. These payment adjustments were based on the density of the finished pavement and/or the production of asphalt paving material to the proper mix design targets. Payment adjustment, either incentive or disincentive, were made by modifying the quantity of the HMA items. This method of payment complicated record keeping of the Contractor, Producer and the Department because it was difficult to track the actual tons of HMA placed.

Materials Bureau staff created a new pay unit called a Quality Unit. All HMA quality adjustments will be measured in quality units and paid at a predetermined index price. One index price will be used for all HMA quality adjustment items in a contract and will apply for the duration of the contract. Index prices will be established and updated by an Engineering Bulletin annually and will be preprinted in the contract documents.

NEW SHEETING AND COFFERDAM SPECIFICATIONS

The Sheeting and Cofferdam Task Force, co-chaired by Geotechnical Engineers, distributed the products of their collaboration. EI's 98-032 and 98-033, effective with the letting of June 10, 1999, contain new sheeting, cofferdam, and excavation items and the guidelines for their use. Along with the new specifications, a new Geotechnical Design Procedure manual (GDP-11) has been issued to document standard design methods for flexible walls.

NEW CONTRACT RESEARCH CONSORTIUM

Coordinating with the Contract Management Bureau, TR&DB developed a request-for-proposal, resulting in an advertised solicitation for a new contract research consortium to replace the recently expired 3 year agreement with a consortium of 10 institutions led by Cornell University. After the selection of the consortium through a competitive process, TR&DB, benefitting from its experience with the first agreement, will assist in the development of a scope of services for the conduct of research, technology transfer, and technical consultation by contract. This scope of services will eliminate ambiguities in some clauses of the previous contract that resulted in differing interpretations. The contract for the new consortium is expected to be executed by Summer, 1999.

EXPANSION OF THE CONTINUOUS COUNTER SYSTEM

The traffic monitoring program is heavily dependent on the statistics derived from the system of approximately 85 continuous counters sited around the state. These statistics include daily, weekly, and seasonal traffic patterns and variations; 30th highest hour (design hour) determinations and variations among types of facilities. Highway Data Services Bureau use these statistics to adjust the 8,000 short counts taken per year to annual averages (AADT). In the past the continuous counters have been constructed when funding was available and/or where they could be conveniently inserted into another construction project. In addition, since they were maintained by the Main Office and had to be visited monthly to download data (they are now downloaded by remote telemetry), they tended to be concentrated in the Albany area. While this has been sufficient for the development of statewide, average statistics, it has become increasingly important to be able to stratify the statistics into finer categories and by area of the state.

The expansion of the program started a few years ago with the addition of continuous counters in NYC (where there previously had been none) and on Long Island. Over the past several months a proposal has been developed to expand the number of continuous counters in the state by 50 (40 sites constructed under contract, 10 sites upgraded in-house) to fill in the statistical gaps and enable the stratification of data to a greater level of detail. In addition, the proposal includes the innovative concept of contracting out for the maintenance and operation of the entire system of continuous counters (old and new) where the contractor will retain ownership of the traffic count devices and be paid on the basis of the amount of data received. In other words, payment will only be made for each full day of data for which counts are received. This approach gives the contractor the incentive to always use the "latest and greatest" equipment available to ensure the most reliable, continuous, and least cost operations. It also relieves the State of the burden of constantly updating specifications and equipment to keep up with the latest innovations in the traffic monitoring arena.

WEIGH-IN-MOTION

The Weigh-in-Motion (WIM) program provides valuable information concerning truck size and weight for use in several Department programs including safety, pavement design, structures design and research. Moreover, the data is useful to the State Police for enforcement screening purposes. The Highway Data Services Bureau will undertake a new initiative to promote the benefits of this program through both the Office of Engineering and the Office of Passenger and Freight Transportation as well as State Police channels. Under the continuous count expansion program, we will be adding 15 sites that will be WIM capable with the addition of readily available software, thus doubling the number of potential WIM sites throughout the state.

IN-SERVICE EVALUATION OF HIGH PERFORMANCE CONCRETE BRIDGE DECKS

In 1996, DOT introduced class HP (for"high performance") concrete for use in bridge decks. This new mix substitutes two pozzolanic materials for cement resulting in lower concrete permeability and increased cracking resistance. Since its introduction, more than 80 NYS bridge decks have been built with Class HP concrete. The Transportation Research and Development Bureau compared the performance of this concrete with previously specified bridge deck concretes, information necessary for continued improvement of New York State's bridge infrastructure. Results indicated that high performance concrete decks performed better than previously specified concrete decks in resisting both longitudinal and transverse cracking.

HIGHWAY PERFORMANCE MONITORING SYSTEM (HPMS)

With the passage of TEA-21, travel values reported in the HPMS Data Files submitted annually by the States will be used as input to the annual Highway Trust Fund apportionment process. Historically, the lane mileage and travel levels reported in HPMS for the Interstate System were the only data inputs taken from the Data Files and were used to apportion Interstate Maintenance funds to the States. The TEA-21 legislation expanded the use of HPMS data to apportion highway federal aid with the intent of introducing more relevant variables to the process. Centerline mileage, lane mileage and daily vehicle miles of travel reported on the entire Federal Aid System (FAS), both National Highway System (NHS) and Surface Transportation Program (STP) eligible roadways, will now be extracted from annual HPMS Submittals for input to the apportionment process.

This change in legislation has triggered an initiative to analyze the HPMS data with the objective of assuring that New York State highway inventory and traffic information is fully representative of actual field conditions. Working with the FHWA, Highway Data Services staff has thoroughly reviewed data on all functionally classified highways that are included in the apportionment formulae. Particular emphasis has been placed on travel data for Principal Arterial and other functionally classified roadways located off the State Touring Route System. A contract has recently been awarded to gather traffic data on principle arterials located in New York City where data is particularly sparse. A parallel effort is focused on a review of the HPMS Sample data and the expansion of that sample to represent the universe of travel. Revised travel estimates have been calculated and submitted to FHWA Headquarters for use in the apportionment process that uses 1997 HPMS data. The results of this analysis will also be incorporated in the 1998 HPMS data submittal to FHWA and will assure that the most accurate and representative data is being used on behalf of New York State in the highway federal aid apportionment process.

BLENDED PORTLAND CEMENTS AND CEMENTITIOUS ADMIXTURES

Materials Bureau staff developed specifications that allow cement suppliers to supply blended cement to portland cement concrete batch plants for use in Department projects. Concrete mixtures for high performance concrete require the substitution for portland cement with fly ash and microsilica at given rates. The object of substituting cementitious admixtures for portland cement is to produce a more durable, less permeable concrete. Cementitious admixtures have traditionally been added to the concrete mixture at the concrete batch plant. The new specifications were implemented with EI 98-030.

FLY ASH SUPPLY

The availability of fly ash, a necessary component of the High Performance concrete mix, decreased in FY 1998-99 relative to previous years. Deregulation of the electricity generation industry contributed significantly to the reduced supply. Fly ash is a waste product from coal burning power generation plants and in previous years, the power plant operators worked closely with suppliers to assure large quantities of high quality fly ash. The deregulation caused the sale of many power plants. In doing so, many plant operators used lower quality coal and failed to make repairs to coal pulverizers during the sale transaction period. These changes affected the quality of fly ash. As a result, Materials Bureau staff worked closely with fly ash suppliers to inspect and approve alternate sources of fly ash to assure continued availability of acceptable fly ash for HP concrete producers.

BRIDGE DECK CONSTRUCTION IMPROVEMENTS

Materials Bureau Staff completed specification changes related to the practices used in the construction on bridge decks. These changes constitute the third and final phase of recommendations made by the Bridge Deck Task Force. The specification changes, implemented by EI 98-037, address four areas of improvement: pre-placement planning; placement technical issues; curing; and loading limitations. Highlights of the EI include the requirement for pre-placement meetings prior to concrete placement, changing consolidation requirements, control of concrete placement rate, improved commencement of curing and increased curing to 14 days, and allowance of limited loading during curing to progress the completion of construction.

EPOXY COATED REINFORCING STEEL STUDY

Materials Bureaus staff completed the final review of a draft report on the performance of epoxy coated reinforcing steel bars in top mats of bridge decks. The report is a culmination of a study by CONCORR, Ashburn, Virginia. The New York State and Pennsylvania Departments of Transportation joined in a pooled fund arrangement to complete the study. CONCORR sampled and tested reinforcing steel from a total of 40 bridge decks in NY and PA. NY developed the technical criteria for the sampling and testing program and PA handled the administration of the contract with CONCORR. The study concluded that the existing condition of epoxy coated rebars in uncracked areas of bridge decks in PA and NY was very good. The frequency of occurrence of progressive corrosion was less than 3% in PA and at least 3% in NY. Coating adhesion reduction or loss was found to be more prevalent and extensive. Analyses showed that more than 50% of epoxy coated rebars in bridge decks in PA and NY exhibited some degree of adhesion reduction within 6 to 10 years of placement in concrete. Coating adhesion loss, however, was not found to be a good predictor of corrosion condition in the study

ADVANCED COMPOSITES FOR BRIDGE REHABILITATION

Since last year, NYSDOT and FHWA have partnered with private industry to take advantage of advanced composite materials for bridge rehabilitation. Three projects have been completed, including replacement of a conventional superstructure, wrapping six bridge columns for protection from environmental deterioration, and strengthening a cracked capbeam. Two of the three structures are instrumented for long-term monitoring to study the effectiveness of composites for bridge applications. These projects will be used as a stepping stone to develop specifications for design and application of advanced composites in bridge rehabilitation. TR&DB actively participated in these projects and assisted Region 6 in their successfully completion. TR&DB also provided technical assistance and instrumentation necessary to analyze stresses and deflections of the deck under loads to verify design assumptions and is conducting long-term monitoring. TR&DB also initiated contract research to conduct finite-element analysis of the bridge deck to assist in future load rating.

EFFIDECK SYSTEM

TR&DB assisted the Structures Division in developing plans for instrumentation and testing of Fort Miller's "Effideck" precast bridge deck system, and in reviewing its finite-element analysis and testing results. Effideck , a lightweight deck system, consists of a thin concrete slab cast with steel tubes, then tied to stringers using conventional stud shear connectors. Testing was conducted by the University of Nebraska, and finite-element modeling and analysis by Ryan-Biggs Associates. Based on the tests, NYSDOT recommended several changes for improved deck performance.

PORTLAND CEMENT CONCRETE PAVEMENT "WHITETOPPING"

Materials Bureau staff arranged for the Department's first "whitetopping" portland cement concrete pavement project in Albany County. The contractor milled 100 mm of hot mix asphalt from the full depth hot mix asphalt ramp between Routes NY 7 and US 9 and replaced it with 100 mm of fiber reinforced early-strength portland cement concrete. The length of the project is approximately 130 meters.

WASTE TIRE RECYCLING

A tire shred embankment has been designed, detailed, and specified to be built in the Route 17, Five-Mile Point to Occanum Project. Geotechnical Engineers developed an agreement between NYS DOT, the Department of Environmental Conservation, DEC, and the Department of Economic Development, DED, to pay a bonus to the Contractor for remediating waste tire stockpiles in association with this project. DEC will oversee the cleanup and DED will fund the bonuses.

CONCRETE VS. GRANITE CURBING

TR&DB completed a study that compares the performance and life-cycle costs for concrete and granite curbing, based on information obtained from a survey of NYSDOT resident maintenance engineers and city engineers of Albany and Schenectady. Although concrete curbs are initially less expensive, comparison of full life-cycle costs indicates that in the long run these costs are similar, considering potential granite recycling and reuse and taking into account removal and disposal of deteriorated concrete. The report of the study includes an easy-to-use chart allowing designers to select the type of curbing by comparing life-cycle costs of the two products based on expected bid prices.

DESIGN OF END AND BASE PLATES FOR TRAFFIC SUPPORT STRUCTURES

TR&DB developed a simplified procedure for design of end and base plates of cantilevered traffic sign, signal, and light structures, and for base plates of span-wire-mounted traffic signal structures. The main advantages of this procedure are that: it presents a general and rational method for design of both end and base plates of these types of traffic support structures, and it is based on simple engineering mechanics concepts that verify critical stresses at more than one location on the plate, and improves current design procedure (which assumes stresses to be critical at only one section, regardless of load orientation or plate configuration). A spreadsheet-based program was developed to use the suggested design procedure and is an efficient tool for optimizing original plate designs or checking those designed by others. This method is more appropriate for cases when span-wire orientation relative to a base plate is specified or field-verified.

EVALUATION OF A NEW DEICER - ICE BAN PLUS

The Transportation Research and Development Bureau, in cooperation with the Transportation Maintenance Division, has been actively involved in evaluation of a new innovative deicer, ICE BAN PLUS, at the Highway Innovative Technology Evaluation Center (HITEC). ICE BAN PLUS (also known as MAGIC) is a 50-50 mixture of ICE BAN, a concentrated liquid residue of the fermentation and distillation of alcohols (ethanol) and the processing of agricultural products, and magnesium chloride. Testing of this substance has shown it to be effective in melting snow and ice faster, and at low temperatures, than sodium chloride, yet is biologically and environmentally inert, non-corrosive, and has no adverse effects on the roads, infrastructure, or vehicles.

Recently, NYSDOT received a certificate from the Civil Engineering Research Foundation, HITEC's parent organization, recognizing our efforts in developing ICE BAN PLUS and highlighting the accomplishments of TSD and TMD in evaluating new and innovative products.

CORROSION IN A SOIL ENVIRONMENT

A field study was conducted to determine the remaining life of existing Mechanically Stabilized Earth Structure walls. The panels were cored, straps were examined visually and with electrical instruments, and measurements were taken. The initial results showed minor corrosion and will be used as a base when the study will be continued this year.

HOT MIX ASPHALT TRAINING

Materials Bureau staff developed a training course and trained over 1,000 Regional staff in hot mix asphalt production and laydown. The course emphasized performance-based specification principles and their application. Trainees included Regional Construction Supervisors, Engineers-in-Charge, and paving inspectors. The training took place at ten locations over a 65 day period.

ASSISTANT DRILL RIG OPERATOR TRAINEESHIP

The Assistant Drill Rig Operator Traineeship has been developed and approved by the Division of Budget. This program is essential for proper staffing of the Regional drill crews. The training aids necessary to implement the program have been developed and are being finalized.

NHI TRAINING COURSE TELECONFERENCE

Materials Bureau staff assisted Region 8 in organizing the Department's first teleconference of a NHI training course. The telecast originated in Albany with other conference centers located in Regions 3, 5, 6, 8 and 10. Over 500 individuals attended the "Superpave for the Generalist" course.

GRANULAR MATERIALS CONTROL PROCEDURE MANUAL

The new Granular Material Control Procedures Manual (GCP-17) has passed a two-year test trial and has been declared final. These procedures streamlined the acceptance procedure, improved the supply of material, and added new controls to safeguard quality. Both the Department and Industry are satisfied with this improvement.

GEOFOAM STABILIZATION

"Geofoam Stabilization of an Embankment Slope," a case history by Walt Jutkofsky of GEB, documented the use of expanded polystyrene foam blocks as a lightweight fill. It was used to lessen the load on an old landslide and stabilize a section of highway. No movement has occurred now in three years.

FEDERAL AID SYSTEM MAPPING PROJECT

The ability to use GIS to access information on the state highway system has long been available. GIS is a powerful tool for accessing, analyzing, and mapping the information which is available through the state highway inventory, pavement scoring, and traffic monitoring programs. What has not been available, however, is the ability to access the equally rich data source known as the local highway inventory (LHI). Through a project initiated several years ago, the Highway Data Services Bureau is well along in "mapping" information available on the LHI to a route system built through GIS. This mapping covers the portion of the Federal Aid System (about 16,000 kilometers of highway) which is not owned by the State. One of the products of this effort is the ability to produce GIS-based maps showing the Functional Classification and Federal Aid eligibility of the entire highway system. Thus far, Regions 1, 6, and 7 have been completed with the full Federal Aid System of highways accessible through GIS.

GEOLOGIC AND AGGREGATE SOURCE MAPS OF NEW YORK STATE

Materials Bureau staff created rock quarry and sand/gravel pit maps with a computer geographic information system (GIS) using geologic data acquired from the State Geologic Survey Office. The maps display source locations, color keyed bedrock geology on the quarry map, and color keyed surficial geology on the sand/gravel pit map. The staff expended considerable effort to achieve colors that resulted in legible copies of maps distributed with the 1998 Sources of Fine and Coarse Aggregates book. Updating these maps will be relatively easy in the future. In addition, the GIS can be used to produce regional maps and special maps displaying sources having a particular geology characteristic.

REMOVING RUBBER SAMPLES FROM ELASTOMERIC BRIDGE BEARINGS

The Materials Bureau has a history of personal injuries in removing rubber samples from elastomeric bridge bearings using sharp hand held knives. Normal configurations of the bearings often made this a very difficult task that often led to lacerations. A Bureau employee identified an electric vibrating scraper in an equipment catalog that could be adapted for this purpose. After a successful trial period, the Bureau adopted the scraper as the method for removing the rubber samples. The device reduced the number of lacerations.

ASPHALT IGNITION OVEN

Materials Bureaus staff installed an ignition oven. The oven heats a mix sample to 1000 to 1200 degrees F whereupon the asphalt ignites and burns off the aggregate particles. The ignition oven replaces the solvent extraction test for determining the asphalt content in the mixture and for recovering aggregate for further testing. It removes the asphalt from the aggregate in approximately half the time. In addition, the use of the oven reduces the use of hazardous trichloroethylene in the laboratory.

NEW CONTROLLER FOR THE LOW-CAPACITY UNIVERSAL TESTING MACHINE

Materials Bureau staff upgraded the controller for the low-capacity (30,000 pounds) universal testing machine to a fully automated computer controlled system. Tests performed on the machine include bolts for bridges; polyethylene drainage pipe; neoprene rubber from bridge bearings; and steel welds from welder qualification tests.. Benefits from the upgrade are increased accuracy in testing; increased capabilities of the machine; increased testing speed; and reduction in human error. The new controller will be connected directly to the Bureau's Laboratory Information Management System in the future.

APPENDIX

DIVISION GOAL STATEMENTS
for 1999/2000

Geotechnical Engineering Bureau

- 99-1 Comparison of Drill Methods
- 99-2 Geotechnical Engineering Quality Assurance
- 99-3 QC/QA of Granular Materials
- 99-4 Revised Pavement Thickness Design Manual*

Highway Data Services Bureau

- 99-5 Initiate the Highway/ Traffic Data Systems Project*
- 99-6 Upgrade the Photolog Program with new State of the Art System*
- 99-7 Complete the Highway Functional Classification Mapping*

Materials Bureau

- 99-8 Precast Concrete QC/QA
- 99-9 Pavement Manual, Preventive Maintenance Treatments
- 99-10 Materials Acceptance Procedures for Construction*

Transportation Research and Development Bureau

- 99-11 Institution of a New Transportation Research Consortium *

* = new goal

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-1Comparison of Drilling Methods: Evaluation of different Hammers for Standard Penetration Testing

As Is: This is a continuation of Op Goal #98-3. Several geotechnical parameters used in design analyses are based on the results of the penetration test performed when drilling and sampling foundation soils. A hammer of a specific weight dropping a standard height provides the energy to drive the standard sampler into the soil. In modern times, safety hammers and automatic hammers have been developed that offer advantages over the donut hammer we have traditionally used for this test. Differences in the way these hammers operate have given different results for the penetration test, with the potential of defining misleading soil parameters. In addition, we have used a different weight of hammer than industry standard, and our correlations to standard methods have never been verified with thorough field measurements.

Desired State: The objective of this goal is to investigate the influence of various hammers and their effect on the Standard Penetration Test (SPT). The influence of the different hammers on the subsurface information and ultimately on the design, analysis, and the cost of highway structures will be reviewed. The relative safety of the systems will also be assessed. After synthesizing the information, a recommended guide describing what factors should be applied to the standard penetration test will be prepared for the use of the designers.

Team Leader: Phil Walton

Team:

Drilling Practice and Techniques:	Scott Misener and Greg Piascik Wayne Johnson Regional Drillers
Impact on Design and Analysis	Gary Douglas Don Acari Steve Borg Judy Doyle
Document Preparation & Support	Walt Jutkofsky Tony Minnitti

Specific Goal for SFY 99-00: The specific goal for the current year is to obtain sufficient field data to compare the different hammers for the Standard Penetration Test. The field study will require special equipment to monitor the energy delivered by the different hammer systems. (Note: a second set of instruments should be purchased to expedite the testing process). Design groups will review the data and evaluate its impact on different design requirements. Recommendations will be made to issue guidelines on factors that should be applied to the SPT blow count to perform designs consistent with past practices.

Rationale: The design, construction, and long term reliable performance of highway systems is dependent upon a quality subsurface exploration program. This goal will improve our capabilities by studying the influence of different SPT hammers and their impact on designs. By properly evaluating the hammers and developing correlation factors, we will be able to provide safer hammers to the Drill Crews and satisfy the designers' needs for consistent SPT results.

Technical Services Division

GOAL STATEMENT

Goal Name: #99-2: Geotechnical Engineering Program Quality Assurance

As Is: Customer satisfaction with the Geotechnical Program has not been formally collected for some time. Dissatisfaction is usually noted through singular incidents and is treated as such. Our customers are not fully aware of our capabilities. Many of our items and solution techniques are so specialized that Engineers-in-Charge and designers cannot be familiar with all of them. Information on problems does not always get back to our staff.

Desired State: Conduct a formal Customer Satisfaction Survey. Produce informative pamphlets about our items and techniques as reference material for regional personnel. Write internal "Lessons Learned" memorandums to improve quality.

Team Leader: Don Dwyer

Team: Bob Burnett, Steve Heiser, Zeke Kyfor, Phil Walton

Specific Goal:
for SFY 1999-2000: This goal is almost completed. We are awaiting the Director's signature on two new Bureau Directives to implement the procedures that will be used to generate pamphlets and "Lessons Learned" memoranda.

Rationale: This will formalize the information flow between ourselves and the Regions. It will lead to fewer misunderstandings, better cooperation, and better implementation of our recommendations. It can be done quickly with a minimum of resources. It demonstrates to the Regions our willingness to be open with them and to assist them. It will improve our internal communication and the quality of our products.

Technical Services Division
GOAL STATEMENT

Goal Name: #99-3 QC/QA of Granular Materials

As Is: The responsibility for quality control of granular materials rests most heavily upon the State. It is not quite as obsolete as in the way it was formerly administered by Soil Control Procedure #13, but even the new Geotechnical Control Procedure #17 puts the majority of the testing burden on DOT. Thus the State does the only "official" testing, and all the effort placed in production quality control by the supplier is not utilized in the acceptance process.

Desired State: Unite production control with the responsibility for quality control. Utilize production quality control in the acceptance procedure. Reduce the State's testing burden to a quality assurance level.

Team Leader: Don Dwyer

Team: Todd Dickson, Steve Mabin, Bob Burnett, ESCAPA representative, AGC representative, Regional representation, Construction Division representation, etc.

Specific Goal for SFY 1999-2000: Review certification and acceptance standards for testing. Benchmark existing practices in this area, particularly surrounding states. Investigate the suitability of "standard" tests for production applications. Develop an action plan to involve industry and investigate their willingness and ability to participate.

Rationale: The actual control of any production process is in the hands of the producer. They must sample and test their own product to keep their process in control. Taking advantage of this work which is already necessary could reduce DOT's workload, if quality can still be assured through random testing and appropriate actions.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-4 Revised Pavement Thickness Design Manual (PTDM)

As Is: The current version of the Thickness Design Manual is in need of revision to include new developments in SUPERPAVE and PCC pavement design and construction details. Revisions are also needed to coordinate with other recent updates to the Standard Specifications and other pavement elements, such as shoulders, underdrains and typical sections for urban conditions.

Desired State: The objective of this goal is to produce a "friendlier" and more thorough design manual. The manual will be reorganized for sequential use which parallels the design process. Some existing tables will be simplified and others expanded, with more guidance and explanation given. More typical sections and greater detail will be included for commonly encountered conditions.

Team Leader: Gary Douglas

Team: Gary Robinson, Makbul Hossain

Support: Bill Snyder, Ron Sines, Julian Bendana

Specific Goal for SFY 99-00: The specific goal for the current year is to publish the 2nd Revision of the Pavement Thickness Design Manual.

Rationale: The current manual includes schematic diagrams which were intended to show the general relation of the key elements of the new pavement design, but these have sometimes been construed as representing required typical sections.

The current PCC design varies the slab length, slab thickness, tie-bar spacing and dowel sizes for transverse joints. The benefit of this adaptability in design is diminished during construction by the requirement for additional inspection on similar features which change from project to project, and added training for inspectors to perform these detailed inspections.

The current manual presents tabulated design information and also the equations from which the tables were developed. On occasion, equations have been mis-used by designers who should have used the existing tables which were adequate and appropriate.

The revised PTDM will address these problems.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-5 Initiate the Highway/Traffic Data Systems Project

As Is: The Department largely decides how to expend a $2 billion Capital and Maintenance budget on outdated (30 year old) traffic and highway inventory data collection & storage technology that is cumbersome to use and maintain, and also limits access to the information the data holds.

Desired State: To implement a networked Client-Server information system which makes critically relevant data easier to collect/maintain and more importantly, is more accessible (on the appropriate informational level) to numerous Department groups, Regional Offices, other State and Federal Agencies, and the public at large. The intent is to deploy a "Relational database" model information system to support the collection, processing, and analysis of this infrastructure database. It would include all the tools necessary to collect, maintain, and summarize the data to verify its integrity and accuracy.

Team Leader: Michael Fay

Team: Tom Kearney, Bernie Schatz, Todd Westhuis, Larry Mulvaney, Allen Pooler, Walt Frisbee

Specific Goal for SFY 99-00: Advance the proposal through the Information Technology Council, solicit funding for the activity, prepare specifications and an RFP, and advertise for and select a consultant/vendor.

Rationale: Management will have more accessible, accurate and timely information on which they can make capital project decisions. Information from this infrastructure data will also be more accessible by numerous NYSDOT, Federal, and local governmental program areas, increasing the benefit derived from the ongoing data maintenance investment.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-6 Upgrade the Photolog Program with new State of the Art System

As Is: The Photolog System is used to view accident locations, design projects, maintenance problems, pavement deterioration, traffic problems, etc. The photolog has been found to be an unlimited tool. The photolog is inaccessible for many department and public users needing to view a particular location or section of highway consistently while working, such as a design squad or the Attorney General's Office.

Desired State: Digitization of existing & future photolog frames to provide direct access to individual frames and/or small sections of highway & related highway inventories by multiple authorized users. This Digitization system would also be capable of converting micro-fiche and other photographic & data storage within the department.

Team Leader: E. John Lewis

Team: Michael Fay, Ralph Hopkins, Robert Powell, Stephen Lester

Specific Goal for SFY 99-00: Advance Photolog Initial Technology Project Proposal through the Information Technology Council. Continue analysis of new data collection and digitization technology as made available in anticipation of developing an RFP and selecting a vendor pending IT Council approval and funding availability. Develop specifications and purchase equipment for an interim manual digitization system capable of scanning individual photolog frames for on-line distribution to the requester as needed and also the capability of storing limited sections of highway on cd for project use.

Rationale: Presently the only means of consistently accessing the Photolog while working on various projects is by providing 8X10 color reproductions. These prints are awkward to use when dealing with a project 2 miles long requiring 200 prints. There is only one photolog viewer and one set of photolog films per region for multiple users.

A system capable of accessing and displaying the photolog on any computer department wide is needed. The Commissioner would be able to view a particular location at his desk. Computer software exists today that allows all users to view a particular photolog frame by just clicking on the appropriate map location. Existing related highway inventories could be interfaced for display with this system.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-7 Complete the Highway Functional Classification Mapping

As Is: Functional class mapping is a by-product of a more inclusive effort to make data for the entire Federal Aid System accessible through GIS. Thus far, the highway data files for the state system for the entire state and the non-state Federal Aid highways for Regions 1, 6, and 7 can be accessed through GIS. For the remaining Regions, the only available maps showing functional classification are photocopies of maps of the functional classification from 1980 with hand-drawn edits to reflect the 1990 Census-based changes.

Desired State: A full integration of the highway data files with the map-based GIS representation for the entire Federal Aid System and a complete set of GIS-based functional classification/Federal Aid System maps for the entire state.

Team Leader: Tom Kearney

Team: Walt Frisbee, Gina Santarcangelo, Donna Ieronimo

Specific Goal for SFY 99-00: Complete the file comparisons and edit checks necessary to produce the GIS files and functional classification maps for three more Regions.

Rationale: With the year 2000 approaching, the next decennial Census will be taken necessitating an update of the urban/rural classification of highways. The Census process typically results in an update to the functional classification system three years later. By completing the mapping project prior to 2003, new maps can be produced simply by changing the functional class designations on the highway files and printing new maps. Without this GIS-based tool, hundreds of new maps will be need to be prepared cartographically (hand drawn, chart taped).

In addition, complete knowledge of the entire Federal Aid System (as opposed to just the state system) is becoming increasingly important in the day-to-day operations of the transportation community. Under TEA-21, in particular, federal funding availability is also dependent on the availability of good, non-state system data as well as state system data. The effort to make the highway data files consistent with and accessible through GIS will be paid back many times through the increased analytical capability and reduced staff time to access the data further down the line.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: #99-8 Precast Concrete QC/QA

As Is: This is a continuation of Goal #98-6. Due to work priority conflicts 98-6 was not completed on time. 99-8 reestablishes new milestones for the completion of this precast concrete QC/QA goal.

The quality assurance procedures for precast concrete vary between products. Some procedures rely heavily on manufacturer's quality control while others rely mostly on sampling, testing and inspection by Department resident plant inspectors. A new specification, 704-03 Precast Concrete, General, that combines products having similar fabrication requirements was recently implemented. No changes were made to the basis of acceptance for the products.

For a considerable number of precast items, the precaster prepares shop drawings in accordance with the contract documents to clearly identify the fabrication requirements. The Department has the responsibility of reviewing and approving these shop drawings. This has the potential to delay project schedules.

Desired State: Utilize quality control by the manufacturer and quality assurance by the Department for assuring acceptable quality in precast concrete units to the extent that is reasonable.

Team Leader: William Snyder

Team: Bob Ziemniak, Region 4, Charlie Schultz, Region 8
Ken Clements, Lou Cocozzo, Materials Bureau

Specific Goal for SFY 99-00: Examine the applicability of the QC/QA process to the manufacture of precast concrete products, and develop revised procedures to accommodate:

1. End result specifications.
2. Shop drawing certification program.

Rationale: The use of precast concrete products by contractors has increased significantly during the past decade and it will continue in the foreseeable future. This increased use has placed a much higher demand for inspectors to cover the manufacturing operations under the standard quality assurance programs. The QC/QA process may be a more effective method for assuring acceptable quality of precast concrete products, while, a shop drawing certification program will provide for more timely processing of drawings.

Technical Services Division

GOAL STATEMENT

Goal Name: #99-9 Pavement Manual, Preventive Maintenance Treatments

As Is: This is a continuation of Goal #98-7 of the same title. New and improved preventive maintenance treatments are available. The Department started to increase the use of these treatments to extend the service life of pavements. Regional pavement management personnel need guidance on the use of these treatments.

Desired State: Have use warrants and application guidelines available to Regional pavement management personnel for cost effective use of "state-of-the-art" preventive maintenance treatments to extend the service life of pavements.

Team Leader: Russell Thielke

Team: Gary Frederick, Brad Allen, Bill Cuerdon, and Ed Denehy.

Specific Goal for SFY 99-00: Publish comprehensive warrants and application guidelines for cost effective use of "state-of-the-art" preventive maintenance treatments to extend the service life of pavements in a new volume of the Department's Pavement Rehabilitation Manual.

Rationale: The use of pavement preventive maintenance treatments by the Department has increased significantly during the past decade as an outgrowth of the Strategic Highway Research Program and they will continue to increase into the future. These treatments are cost effective only when applied to the proper candidate projects. The new volume of the Pavement manual will provide necessary guidance to Regional pavement management personnel for their use.

Technical Services Division

GOAL STATEMENT

Goal Name: #99-10 Materials Acceptance Quality Assurance Procedures for Construction

As Is: The regulation for quality assurance procedures for construction, 23 CFR 637 (last revised January 1987), the Department is currently operating under was written using the traditional concept of the State performing all sampling and testing. This regulation does not address the use of contractor supplied test results in the acceptance decision by the State as part of its Quality Control/Quality Assurance Program for Hot Mix Asphalt and Portland Cement Concrete materials. Additionally, the mandated independent assurance sampling and testing program requires testing to be performed by State personnel at an approximate frequency of 10 percent of the required quality assurance testing.

Desired State: Full implementation of quality assurance procedures for construction of HMA and PCC which take full advantage of the revised regulation (adopted July 1995). The revised regulation allows flexibility in the design of the States acceptance programs. Specifically, the regulation now allows the use of contractor test results in making acceptance decisions, and the use of consultants in the required independent assurance program and verification sampling programs. The required testing must be performed by qualified laboratories and personnel, however, the requirements for "qualification" will be determined by the State.

Team Leader: Ron Sines

Team: Don Streeter, Zoeb Zavery, Ken Clements, Rosemary Mahoney, William Koniowka, Bill Brudi (R-10), Peter Melas (R-1), and David Hart (FHWA)

Specific Goal for SFY 99-00: To bring NYSDOT's quality assurance procedures for construction of HMA and PCC in full compliance with Federal Regulation 23 CFR 637 Subpart B. Specifically:

- NYSDOT's central laboratory must be accredited by the AASHTO Accreditation Program by June 30, 1997.
- All NYSDOT, contractor, and vendor test results used in the acceptance decision (quality control and quality assurance test results) or as part of the independent assurance sampling and testing program will be performed by a qualified laboratory and qualified personnel by June 29, 2000.
- Non-NYSDOT laboratories that perform independent assurance sampling and testing or are used in dispute resolution sampling and testing must be accredited by the AASHTO Accreditation Program by June 29, 2000. Additionally, these laboratories may perform only one type of testing (verification, quality control, independent assurance, or dispute resolution) on the same project.

Rationale: The benefits resulting from the use of performance-relates specifications are becoming more apparent with their expanded use as contractors and materials suppliers are heavily involved in the quality process. The use of contractor supplied test results is an essential component to insuring this involvement. Compliance with the revised regulation will establish the criteria for the necessary checks and balances required to protect the public investment.

TECHNICAL SERVICES DIVISION
GOAL STATEMENT

Goal Name: 99-11 Institution of a New Transportation Research Consortium

As Is: In 1996, NYSDOT executed a three-year agreement with a consortium of institutions led by Cornell University for the conduct of contract research, technology transfer and consultation services. The Department has deemed that such partnership was mutually beneficial and has primarily yielded successful products allowing the Department to supplement its own expertise and utilize valuable resources available at the university. After the expiration of current contract, the Department will institute a new Consortium through a competitive Request for Proposals (RFP) process. This new partnership will benefit from a wealth of experience gained from the previous agreement.

Desired Status: Advertise for a new master agreement, establish a Consortium based on competitive RFP process, institute the new Consortium, develop policies and procedures that guide Consortium/Department operations.

Team Lead: O. A. Elrahman, TR&DB

Team Members: Robert Valenti, Colin Campbell, TR&DB
Peter Meixner, Contract Management Bureau

Specific Goal for SFY 99-2000: Institute the new Consortium and its operational mechanism which would ensure its functioning according to tested policies and procedures through the following:

1. Advertise for a new master agreement and select a new consortium;

2. Develop and execute a contract which utilize clear contract clauses. Ambiguous clauses have previously delayed the start of work, and led to misinterpretations by principals;

3. Develop policies and procedures handbook to guide the activities of the Consortium, and organize its interactions with the Department. This handbook will include:

a. Duties and functions of the Steering Committee and framework for its operations. This Committee will be responsible for joint analysis and planning for Consortium/Department partnership.

b. Programming processes that will guide the Contract research program from inception to implementation.

Rationale: The Department will institute a new partnership that will build on the experience learned from implementing the previous partnership, thus strengthening its operations, streamlining its activities, and addressing the Department's contract research needs in the most cost-effective and efficient manner.

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